4/15/08-00698

VDEQ Responses to Navy RTCs
Draft Remedial Investigation Report for Site 21
St. Juliens Creek Annex
Chesapeake, Virginia

VDEQ Comment 1. *Soil*

According to Figure 2-4 only six soil samples have been taken across the site, and only three of those samples were analyzed for PCBs/pesticides. Of the three samples analyzed for PCBs, one indicated a possible PCB issue, at 11SS01 Aroclor-1260 = 6.1 mg/kg. Additionally, no confirmation samples were taken following soil removal at Site 9. While soil was ruled out as a media of concern for sites previously determined to require no further action (sites 9/14, 10, 11, 12, 13, 18), it appears that soil contamination and human health risk from soil across Site 21 have not been fully assessed. Please address these concerns.

Response to VDEQ Comment 1.

Although only six soil samples have been collected across what is now considered Site 21, the soil is believed to have been fully assessed and no additional data collection will be incorporated into the RI. Sample locations and analyses were selected based on review of historical site information for identification of potential CERCLA releases at Sites 9/14, 10, 11, 12, 13, and 18. The investigation results for Sites 10, 11, 12, 13, and 18 were presented and evaluated, along with the potential risk to human health and the environment in the SSA (CH2M HILL, 2002). The SSA concluded that the sites were fully characterized and recommended no further action for soil, and was reviewed and approved by the team. Although Site 9 was not evaluated in the SSA, it was closed with no further action in the Federal Facilities Agreement on the basis of the soil removal conducted during construction of Building 1556 (DoD, 2004). The Navy attempted to locate additional records regarding the removal conducted at IR Sites 9/14, but because the soil removal was conducted in association with the MILCON project and not under CERCLA, records associated with the removal were maintained with the contract files associated with the building construction contract. The Navy determined that these records were archived in 1995 and subsequently destroyed in 2001. The Navy spoke with the ROICC representative, who subsequently conferred with prime contractor's project manager for the MILCON; both recall that the petroleum contaminated soils were removed and disposed of off-site in a landfill, and that confirmation samples were collected; however, records cannot be located. The Navy is checking other potential sources for specific site information. Following excavation and disposal of the petroleum contaminated soil during construction of Building 1556, the team reached consensus for no further action during the June 1999 meeting. The consensus is further documented in the FFA (DoD, 2004). The site is currently located under a building and/or paved area where no VOC contamination has been identified. No additional soil sampling is therefore necessary.

Soil samples may appear to be limited based on the current size of Site 21. However, the site was originally identified to be much smaller, and has grown significantly over the years as a result of the CVOC groundwater plume delineation. The extent of contamination in groundwater appears consistent with CERCLA releases, as small amounts of contamination can impact large areas of groundwater through advection and dispersion. In soil, contaminant transport is generally downward into the saturated zone (into the groundwater). No additional sources of potential soil contamination have been identified to lead to further investigation of soil, and the only site-related COCs identified in groundwater are VOCs. Therefore, there is no reason to believe that additional contaminants are present in the soil to warrant additional investigation.

Based on saturated soil samples collected during the RI, it is believed that residual DNAPL may be present in saturated soil at the top of the confining unit in some areas, providing a continual source of contamination to the shallow aquifer. The remedial action chosen to address the groundwater contamination will take that into consideration. Therefore, soil sampling would not provide any additional information needed to aid in site remediation.

VDEQ Response to Navy RTC on Comment 1.

The VDEQ does not concur with the Navy RTC that soil at Site 21 has been fully assessed. Based on information included in the RI, the extent of PCB contamination in soil near Building 47 was not delineated and petroleum contaminated soil was removed from Sites 9/14 but the confirmation sample results cannot be located - therefore, it is not known if all contaminated soil was removed. Additionally, not enough information is included in the RI on soil at the NFA sites (sites 9/14, 10, 11, 12, 13, 18) to be able to utilize those investigations as supporting lines of evidence. As noted in VDEQ comment 9, this additional information could be discussed in a separate soil subsection included in

Section 9.1.

VDEQ Comment 2. *Tables 2-3, 5-4 & 5-5 – Method detection limits*
As noted in the tables referenced above there are many instances where the method detection limit exceeds the MCL for a constituent. Therefore, the possibility of actual detects of these constituents above MCLs cannot be ruled out and must be taken into account throughout the document. The DEQ recognizes the use of, "One-half of the sample quantitation limit...for cases where no detectable contaminant concentrations were found in a sample, but the contaminant was detected in other samples collected from the same medium" *(page 7-2, fourth bullet)* as a means to complete a risk assessment without discounting the importance of these data points. However, the uncertainties associated with this assumption were not carried through the entire document (figures, data summaries, investigation results) and were not discussed in the uncertainties section of the risk assessment. Please address these concerns.

Response to VDEQ Comment 2. The CLP method was selected based on the expected concentrations of contaminants (OLM04 for medium/high concentration or OLC03 for low concentration). Reporting limits are dictated by the CLP analytical method, and labs are unable to analyze high concentration samples using a low concentration method without risking instrumentation damage (e.g., the highest contaminant concentration will dictate the method). It is not appropriate to use the low concentration method for samples with expected concentrations greater than 25 µg/L. Since average concentrations exceed 25 µg/L within the CVOC plume, the low concentration method was not be used with the exception of for delineation of the perimeter of the plume where concentrations were expected to be low. The reporting limit for the medium/high concentration method is 10 µg/L, which exceeds the MCL for some of the CVOCs. However, per the CLP methodology detects above the MDL but below the reporting limit are reported with a J qualifier (e.g., at MW16S, where the reporting limit was 670 µg/L for cis-1,2-DCE and a result of 460 J µg/L was reported; and at TW122, where the reporting limit was 10 µg/L for VC and a result of 4 J µg/L was reported).

Uncertainties associated with reporting limits above the MCLs will be addressed in Sections 5.1.4, 5.1.5, 7.5, and 9.1 of the text. Notes will also be added to figures where appropriate.

VDEQ Response to Navy RTC on Comment 2.
Navy RTC is acceptable at this time; however, the original VDEQ comment should be accounted for during future groundwater monitoring.

VDEQ Comment 3. *Figures 5-4 & 5-5 – Clarification of data included in figures*
When comparing the data from Tables 5-4 and 5-5 to Figures 5-3, 5-4, and 5-5 there is no apparent method to how data was selected for inclusion on the figures. In some cases, maximum values over several monitoring events were used – in other cases, the most recent values were used, and in still other cases, values were omitted altogether. Additionally, isoconcentration lines are not accurate in some areas on the figures. Please explain which data were incorporated into the figures and correct inconsistencies.

Response to VDEQ Comment 3. Figures 5-3, 5-4, and 5-5 will be revised to show the most recent values. In cases where a contaminant was previously detected, but not detected in the most recent rounds and in which the detection limit is above the MCL for the most recent round, the previous detection will be used. Notes will be added to each plume figure and Section 5.1.4 to clarify which data are shown on the figure and used to delineate the plume.

VDEQ Response to Navy RTC on Comment 3.
Navy RTC is acceptable at this time.

VDEQ Comment 4. *TCE concentrations at MW01S and 21GW02*
According to Tables 2-3 and 5-4, the concentration of TCE at 21GW02 (sampled in 1996) was 2,400 ug/L; at MW01S (sampled in 2005) TCE was detected at 1.3 ug/L. Since these sampling points are collocated (per Figure 2-4) the substantial difference in concentrations is troubling. Please discuss possible explanations for why this discrepancy exists.

Response to VDEQ Comment 4. The reason for the variation in the data between 1996 and 2005 is unknown. However, because three groundwater samples have been collected from MW01S (2003, 2004, and 2005) since the RRR sample (1996), and the results have been consistent (2B, 0.81B, and 1.3 µg/L, respectively), they are believed to accurately represent the current site conditions. Different methods were used to collect the samples: 21GW02 was collected using DPT from a 3-ft screened interval and SJS21-MW01S-03C, 04D, and 05D were collected from permanent monitoring well MW01S from a 10-ft screened interval. Additionally, the data from 21GW02 was not validated, presenting some uncertainty. It is also possible that TCE concentrations in that portion of the plume changed due to natural attenuation and/or plume migration.

VDEQ Response to Navy RTC on Comment 4.
Information presented in the Navy RTC suggests that using a larger screened interval has diluted the concentrations – indicating that a much higher concentration of TCE may exist at this location. Additionally, this suggests that concentrations across the site likely have been diluted by use of the large screened interval.

VDEQ Comment 5. *Page 5-3, second full paragraph and Page 9-1, second paragraph*
COPCs that when analyzed produced non-detect concentrations where detection limits exceed MCLs should be accounted for in these two paragraphs.

Response to VDEQ Comment 5. See response to Comment 2. The RI report will be amended where appropriate to address the uncertainties.

VDEQ Response to Navy RTC on Comment 5.
See VDEQ Response to Navy RTC on Comment 2.

VDEQ Comment 6. *Page 6-3, last paragraph, second sentence* – This sentence is incorrect, cis-1,2-DCE at MW16S is 460 ug/L, at DW102 (collocated with MW12S) cis-1,2-DCE was detected at 3,500 ug/L and at MW15S cis-1,2-DCE is 2,600 ug/L.

Response to VDEQ Comment 6. The sentence will be corrected as requested.

VDEQ Response to Navy RTC on Comment 6.
Navy RTC is acceptable at this time.

VDEQ Comment 7. *Page 6-3, last paragraph, fifth sentence*
This sentence may not be correct, the detection limit for VC at MW07S has been as high as 2,500 ug/L, at MW15S is 2,000 ug/L, at MW16S is 670 ug/L, at TW107 is 500 ug/L. Therefore, the highest concentrations of VC could be found at any one of these sampling locations.

Response to VDEQ Comment 7. The referenced sentence will be revised to clarify that it refers to the highest "detected" concentration of VC, and the uncertainties of nondetects due to elevated detection limits above the MCL will be addressed throughout the RI report (see response to Comment 2).

Note that although the detection limit for VC at MW07S has been as high as 2,500 µg/L (2004), samples with lower detection limits have been analyzed since that sample was analyzed, including detection limits of 500 and 10 µg/L in 2005. Additionally, a depth-specific sample collected at the bottom of the Columbia aquifer adjacent to MW07S yielded a result of only 4J µg/L. Although the detection limit for VC at MW15S was high in the only sample collected from that well, MW12S is located only 25 feet away and has a recent detection of 9J µg/L (2005). And although the detection limit of the sample collected from TW107 was elevated, TW107 is co-located with MW13S, at which a VC concentration of 86 µg/L has been detected. Although the detection limit is high at MW16S, laboratories are able to detect concentrations below the detection limits, and MW16S is bounded by other sample locations with non-detects and/or low detections. Therefore, in spite of the elevated detection limits in samples from some locations, there is a reasonable level of certainty with the presented nature and extent of VC contamination in groundwater. The selected remedial action for the site will address VC, and post remedial action monitoring will be conducted to confirm its effectiveness (including lower detection limits).

VDEQ Response to Navy RTC on Comment 7.
Navy RTC is acceptable at this time.

VDEQ Comment 8. *Page 6-3, last paragraph, last sentence*
This sentence is incorrect, MW16S is located to the southeast and concentrations of VC have not been detected at this well (detection limit is 670 ug/L). Also, MW13S is located to the southwest.

Response to VDEQ Comment 8. The last sentence in the last paragraph of the RI report will be amended to read, "VC has also been detected at lower concentrations in the north and southwest areas of the site as shown in Figure 5-5".

VDEQ Response to Navy RTC on Comment 8.
Navy RTC is acceptable at this time.

VDEQ Comment 9. *Page 9-1, section 9.1, Nature and Extent of Contamination*
Soil contamination is not included in this section and should be added as a separate subsection (i.e. section 9.1.4).

Response to VDEQ Comment 9. Because the team previously agreed to no further action or investigation for soil (SSA and FFA) and investigation of soil was not an objective of the RI, soil will not be discussed in Section 9 of the RI report.

VDEQ Response to Navy RTC on Comment 9.
Whether or not NFA for soils at other sites has been agreed to in the past, Site 21 soil contamination still needs to be addressed in this section so that all of the data gaps can be evaluated. Additionally, see VDEQ response to Navy RTC on Comment 1.

VDEQ Comment 10. *Page 9-1, fifth paragraph*
The end of the second sentence of this paragraph reads, "...it has not been positively determined whether DNAPL is present." However, on page 6-5, the last sentence of the fourth paragraph reads, "The depth-specific CVOC concentrations were 2 to 7 times higher (than concentrations from the entire screened interval), indicating that CVOC concentrations at the base of the aquifer at MW15S and MW16S may also be higher and further support the conclusion that DNAPL is likely present." For TCE, the indicator for potential DNAPL is a concentration of 11,000 ug/L in groundwater. Please change the sentence to be consistent with the available data to indicate that DNAPL is likely present.

Response to VDEQ Comment 10. The two sections referenced are not contradictory. Because of the unusual pathways that DNAPLs migrate, they are very hard to observe directly. At most sites where DNAPL is concluded to likely be present, direct evidence (such as pulling up a bailer with DNAPL or finding a soil core that responds to DNAPL-detecting dye) is not found. As a general rule-of-thumb, dissolved concentrations of CVOCs in groundwater in excess of approximately 1 percent of a compound's solubility suggest that DNAPL may be present; however, it is not a guarantee. Based on the rule-of-thumb, DNAPL is likely present at Site 21, though it has not been confirmed through observation or soil sampling. The text in Section 9.1.1 of the RI report is acknowledging the uncertainty in DNAPL. It states that its presence has not been positively determined (e.g., DNAPL has not been physically observed in groundwater and the soil screen tests were negative); however, it is likely present based on the concentrations detected in groundwater. The last sentence of Section 9.1.1 will be revised from "potential presence" to "likely presence".

VDEQ Response to Navy RTC on Comment 10.
Navy RTC is acceptable at this time.

VDEQ Comment 11. *Page 9-1, fifth paragraph, last sentence*
The first portion of this sentence states, "CVOC concentrations in soil are not indicative of DNAPL..." However, soil contamination across the site has not been adequately assessed (see comment #1). Data limitations should be considered throughout the document.

Response to VDEQ Comment 11. The team previously determined that soil required no further action (SSA and FFA). See response to Comment #1. RI soil samples were only collected to support evaluation of remedial alternatives and determine the presence or absence of DNAPL. These samples were collected in the saturated zone at the top of the confining unit, and would not be used for determining the nature and extent of contamination or soil risk evaluation (only soil above the water table is evaluated as soil). Regarding soil above the water table, approximately 25 MIP points were advanced that show no VOC contamination in the unsaturated zone based on ECD readings. Therefore, additional soil sampling for VOCs or DNAPL evaluation is not warranted.

VDEQ Response to Navy RTC on Comment 11.
See VDEQ Response to Navy RTC on Comment 1.

VDEQ Comment 12. *Page 9-4, section 9.5.1*
Update section based on resolution of Site 21 Vapor Intrusion Work Plan comments, i.e. there is a potential risk identified from vapor intrusion into Buildings 1556 and 47 in addition to Building 54; the FS should include further evaluation of potential vapor intrusion pathways in Buildings 1556 and 47 in addition to Building 54.

Response to VDEQ Comment 12. Resolution of Site 21 Vapor Intrusion Work Plan comments is ongoing. The outcome and the results of the subsequent indoor air vapor investigation will be incorporated throughout the RI report where appropriate or presented in an RI addendum. The specific content will depend on the scope of the investigation, which has not yet been jointly developed by the team.

VDEQ Response to Navy RTC on Comment 12.
Navy RTC is acceptable at this time.

VDEQ Comment 13. *Page 9-4, section 9.5.1, first paragraph, last sentence*
The Draft Navy Policy on Evaluating the Vapor Intrusion Pathway has not been made available to VDEQ for reference. Additionally, the EPA 2002 Vapor Intrusion Guidance should be considered when evaluating risk from vapor intrusion at Site 21.

Response to VDEQ Comment 13. The RI recommendations (including Section 9.5.1) will be revised based on the team resolution of the air vapor investigation/evaluation. The Draft Navy Policy on Evaluating the Vapor Intrusion Pathway will not be referenced in the final RI report if it has not been made available. EPA's 2002 vapor intrusion guidance will be considered, along with any subsequent guidance documents that emerge.

VDEQ Response to Navy RTC on Comment 13.
Navy RTC is acceptable at this time.

VDEQ Comment 14. *Page 9-5, section 9.5.2*
Since arsenic in deep groundwater has historically exceeded the MCL, monitoring of this constituent may be necessary.

Response to VDEQ Comment 14. Arsenic has exceeded the MCL in only one of the three samples collected from MW01D. Future monitoring of deep groundwater is not planned, as there is no indication that deep groundwater has been impacted by a CERCLA release. The only site-related COPCs identified in shallow groundwater are CVOCs, and no CVOCs have been detected in deep groundwater at concentrations exceeding the MCL. Arsenic was detected sporadically in deep groundwater but was not identified in shallow groundwater within the same area of the site, indicating it is not likely the result of a site release. A laterally extensive hydraulic clay aquitard (Yorktown confining unit) that is approximately 17-ft thick is present in which there is very low vertical permeability, preventing downward migration of COPCs. Therefore, the arsenic detected in the deep groundwater is not considered to be site-related and no further monitoring of the constituent is necessary.

VDEQ Response to Navy RTC on Comment 14.
The VDEQ does not concur with the Navy RTC that future deep groundwater monitoring is not necessary. Further discussion by the SJCA partnering team on future monitoring site-wide may provide resolution.